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**FLUORINE AND DENTAL CARIES**

Cecil I. Coburn and Roger G. Knipe

**CONTROL OF FLIES ON A DISTRICT BASIS**

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# *Canadian Journal of* **PUBLIC HEALTH**

VOLUME 44

TORONTO, APRIL 1953

NUMBER 4

## **Fluorine and Dental Caries**

CECIL I. COBURN,\* D.D.S., D.D.P.H.

AND

ROGER G. KNIPE,† M.D., D.P.H.

*The Elgin-St. Thomas Health Unit  
St. Thomas, Ontario*

MANY epidemiological investigations have presented evidence that there is a substantial reduction in dental caries when fluorides are naturally present in drinking water.<sup>1</sup> In 1951 it was learned that one source of public water supply in Elgin County had fluorides naturally present, and it was, therefore, decided to take advantage of this favourable situation which would afford a comparison on a basis similar to previous studies of this nature. In addition, such information obtained from the investigation might have local value in support of a recommendation for artificial fluoridation of a public water supply, a project which the Board of the Elgin-St. Thomas Health Unit has recently recommended to the City of St. Thomas.

### *Geography*

Elgin County, with a population of 55,518 (1951 Dominion census), is approximately 60 miles in length, and varies from 10 to 18 miles in width, with an area of about 700 square miles (Fig. 1). Lake Erie forms the southern boundary. It has a very diversified agriculture, and of recent years has developed extensive tobacco farming.

St. Thomas, the County seat, is an industrial and railroad centre. The population of the County is predominately Anglo-Saxon in origin.

### *Source of Data*

The material used in this study was obtained from the records of a dental survey conducted by the dental officer during 1951-1952, when 7,327 elementary school children in Elgin County were examined. All examinations were

\*Dental Health Officer.

†Director.

made by the same examiner, using mouth mirrors and explorers of uniform type. A portable examining light was used when necessary. No radiographs were taken. Diagrammatic charts were used for recording the information.

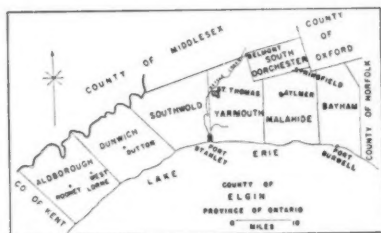


FIG 1

### History

At the time of formation of the section of Preventive Dentistry in the Elgin-St. Thomas Health Unit, July, 1951, it was learned that water from one of the three wells presently supplying the town of Aylmer contained fluorides. Periodic analyses revealed that all three wells usually showed an equal fluoride content of 1.2 p.p.m., except during the fall of 1952, when the fluoride ratio of the tap water dropped to a low of 0.8 p.p.m. Two of the wells are situated about one half mile north and one and a half miles east of the town. The other well is within the town limits. Water from these wells is pumped to two standpipe storage tanks, and is fed by gravity to the mains. The wells were brought into production in the following order: no. 1 well (not now in use) in 1932, no. 2 well in 1934, no. 3 well in 1939, and no. 3A well in 1947.

By 1939 there remained approximately 50 private wells in use in the town, but that number has since dwindled to perhaps 1 or 2 at the present time.

In general, it may be assumed that native-born children of Aylmer, examined in the survey, received the benefit, since birth, of water containing fluorides at or near the desirable proportions for the reduction of dental caries.<sup>2</sup> Not one case of dental fluorosis<sup>3</sup> (mottled enamel) was observed in this group.

The source of water supply for the City of St. Thomas is almost entirely derived from Kettle Creek, with a watershed of approximately 60 square miles, together with a small undetermined amount of underground water from artesian wells located up stream. There is also a dug well at the pumping station. Fluoride tests of the water on one occasion showed 0.2 p.p.m. fluoride in the dug well, 0.25 in the basin, and 0.0 p.p.m. in the main. However, monthly analyses of the St. Thomas tap water show the fluoride content ranging from 0.0 p.p.m. to 0.3 p.p.m., with a greater frequency of 0.2 p.p.m. St. Thomas has been obtaining its water supply from this source since 1890. The artesian wells were drilled before 1918.

The Villages of Port Stanley, Dutton, West Lorne and Rodney obtain their water supply from Lake Erie, the date of installation being in the following order: Port Stanley, 1914; West Lorne, 1939; Dutton, 1945; Rodney, 1946. Tests have indicated the complete absence of fluorides in their tap water.

The source of water supply was from private wells in Dutton and Rodney, before 1945-46.

For the basis of this study, it was decided to compare only those municipalities with a public water supply and a known fluoride content in their drinking water. The population of these areas (1951 Dominion census) is as follows:

	City of St. Thomas	18,173
	Town of Aylmer	3,483
Villages of:	Port Stanley	1,491
	Rodney	885
	West Lorne	1,031
	Dutton	794

#### *Selection of Children for the Study*

At the time of examination, the Town of Aylmer had a school population, age 6 to 14, of 580. From this group were selected all children who were native-born or had moved there during the first year of birth. To obtain information as to length of continuous residence and source of water, the younger children took home a form for the parent to fill out. These were returned to the respective teacher and collected by the examiner. When any doubt existed, the home was contacted. A similar plan was adopted for the children of St. Thomas and the Villages. All children selected used municipal water and had continuous residence.

As it was found that the number of native-born Village children was too small for a satisfactory comparison, to this group were added those who had lived continuously in their locality for the preceding six years. The St. Thomas group was selected on the same qualifications of residence as the Village children. This difference in residence requirements for the St. Thomas and Village children, as compared with Aylmer, could result in the inclusion of some children in the two former groups who for a time did consume water containing higher levels of fluoride than the water of St. Thomas and the Villages. The effect of this discrepancy would have a tendency to reduce rather than increase any differences in dental findings expected between Aylmer on the one hand, and St. Thomas and the Villages on the other.

The absolute and percent distribution of children examined, by age and location, is shown in Table I.

TABLE I

THE ABSOLUTE AND PERCENT DISTRIBUTION OF CHILDREN EXAMINED AT THE TOWN OF AYLMER; VILLAGES OF DUTTON, RODNEY, WEST LORNE, PORT STANLEY; AND THE CITY OF ST. THOMAS, ACCORDING TO AGE GROUP

Age Group	Aylmer		Villages		St. Thomas	
	No.	Per Cent	No.	Per Cent	No.	Per Cent
6-8	97	50.5	136	43.2	528	35.7
9-11	55	28.7	103	32.7	580	39.3
12-14	40	20.8	76	24.1	369	25.0
TOTAL	192	100.0	315	100.0	1477	100.0

## FINDINGS

Table II shows the caries incidence in deciduous teeth. The significant period in this category is 6 to 8 years, before many of the deciduous teeth are replaced by their permanent successors (a process which begins at about 7 years of age).

The 9-to-11-year period is not significant. The premature loss of deciduous teeth, as a result of caries, has a tendency to accelerate the eruption of the succeeding permanent teeth; a factor which may directly influence the findings in this age group in St. Thomas and the Villages, and, to some extent, may account for the sharp increase with age in percent of caries-free children as shown in Table II.

TABLE II

PERCENTAGE OF CHILDREN EXAMINED HAVING CARIES FREE DECIDUOUS TEETH, BY AGE AT EXAMINATION

Survey 1951-52	6-8 years	9-11 years
	<i>Per cent</i>	<i>Per cent</i>
Aylmer	33.0	29.1
Villages	7.4	17.5
St. Thomas	13.4	26.9
	$\chi^2$ 32.1	4.5
	$P < 0.01$	$> 0.05$

Table III deals solely with permanent teeth. The important age in this table is the 12-to-14-year group. Most of the permanent teeth are present at this period, many of which have been exposed to the influence of caries for 6 to 8 years.

TABLE III

PERCENTAGE OF CHILDREN EXAMINED HAVING CARIES FREE PERMANENT TEETH, BY AGE AT EXAMINATION

Survey 1951-52	6-8 years	9-11 years	12-14 years
	<i>Per Cent</i>	<i>Per Cent</i>	<i>Per Cent</i>
Aylmer	72.2	25.5	32.5
Villages	31.6	5.8	3.9
St. Thomas	52.3	9.5	5.7
	$\chi^2$ 38.1	16.3	39.3
	$P < 0.01$	$< 0.01$	$< 0.01$

Table IV shows the dental-caries experience in terms of D.M.F. (decayed, missing, filled) permanent tooth surfaces per child (a value of three has been given to each missing tooth as an estimate of the carious surface experience of such teeth).

TABLE IV

D.M.F. (DECAYED, MISSING, FILLED) PERMANENT TOOTH SURFACES PER CHILD EXAMINED, BY AGE AT EXAMINATION

Survey 1951-52	6-8 years	9-11 years	12-14 years
	<i>Per Cent</i>	<i>Per Cent</i>	<i>Per Cent</i>
Aylmer	.6	3.5	5.8
Villages	3.3	6.1	13.2
St. Thomas	1.9	6.1	10.7

Table V indicates the D.M.F. index for all County children, age 12 to 14 years (for statistical purposes, St. Thomas and Aylmer are shown separately from the Townships). The totals of children, age 12 to 14, for St. Thomas and Aylmer, in Table V, include all children, regardless of length of residence.

TABLE V

DECAYED, MISSING AND FILLED (D.M.F.) PERMANENT TOOTH SURFACES AND PERCENTAGE COMPOSITION OF D.M.F. IN CHILDREN AGE 12-14 YEARS  
ELGIN COUNTY, 1951-52

Area	No. of Children	Decayed		Missing		Filled		D.M.F.		Percentage		Composition	
		No.	per child	No.	per child	No.	per child	No.	per child	D.M.F.	D.	M.	F.
Bayham	166	1181	7.1	522	3.1	448	2.7	2151	13.0	100	54.9	24.3	20.8
City of St. Thomas	495	2020	4.1	1083	2.2	1935	3.9	5038	10.2	100	40.1	21.5	38.4
Yarmouth	239	1046	4.4	522	2.2	717	3.0	2285	9.6	100	45.8	22.8	31.4
Aldbrough	150	797	5.3	357	2.4	274	1.8	1428	9.5	100	55.8	25.0	19.2
Malahide	147	604	4.1	288	2.0	401	2.7	1293	8.8	100	46.7	22.3	31.0
Dunwich	80	375	4.7	165	2.1	126	1.6	666	8.3	100	56.3	24.8	18.9
Southwold	123	508	4.1	204	1.7	225	1.8	937	7.6	100	54.2	21.8	24.0
S. Dorchester	68	227	3.3	96	1.4	159	2.3	482	7.1	100	47.1	19.9	33.0
Town of Aylmer	112	422	3.8	147	1.3	218	1.9	787	7.0	100	53.6	18.7	27.7

It was noted that when the total number (2,178) of St. Thomas children examined in the survey was compared with the number (1,477) of St. Thomas children in the study, there was little difference in caries incidence in the deciduous and permanent teeth. The caries experience (D.M.F.), 12 to 14 years, is very similar (Tables IV and V).

The clinical evidence of mottled enamel and fluoride analysis of water from certain private wells in South Dorchester indicate a fluoride area in that Township.

It will be noted in Table V that the Township of South Dorchester has a D.M.F. index comparable to that for Aylmer children in the same age group.

With respect to the Aylmer study group, and South Dorchester children with slight mottling of the enamel, it was observed that the carious process in permanent teeth appeared to follow a different pattern from that which was noticed in other areas, in that unfilled decayed surfaces were inclined to be shallow, exhibiting the characteristics of "slow decay", and usually confined to pits and fissures in the occlusal (grinding) surfaces of molar teeth.

There is no significant difference in the oral hygiene status of St. Thomas, Aylmer and South Dorchester children.

The children of the Villages exhibited a lower standard of oral hygiene.

Sex differences were not considered to be a factor in these findings.

#### SUMMARY

1. Allowing for the relatively small number of eligible Aylmer children, there appears to exist in that group a much higher degree of immunity to



dental caries, when compared with St. Thomas and the Villages. The percentage of children with caries-free permanent teeth, especially in the 12-to-14-year group, is considerably higher in Aylmer than in the corresponding group in St. Thomas and the Villages.

2. In caries experience (D.M.F.), permanent tooth surfaces, Aylmer children exhibit considerably less dental decay per child than the children of St. Thomas and the Villages.

3. The Aylmer native-born (or those who have lived there continuously since the first year of birth), 12 to 14 years (Table IV), have a lower caries experience of permanent teeth than the total Aylmer children of the same age group (Table V).

4. There does not appear to be any appreciable difference in comparisons between the St. Thomas children selected for the study on the basis of residence, and the total number of St. Thomas children.

5. The caries experience of children in the Township of South Dorchester, where there is evidence of fluorides in private wells, closely parallels that of children of the same age resident in Aylmer.

6. There appears to be a difference in the pattern of the carious process in permanent teeth, when fluorides near the optimum level are present in the drinking water.

7. Although some differences in oral hygiene were noted, they do not influence the St. Thomas-Aylmer comparison where oral hygiene habits were similar.

#### CONCLUSIONS

While this study indicates a higher immunity to dental caries when fluorides are naturally present in drinking water, the degree of this immunity cannot be accurately measured without subsequent comparisons. Other variables such as racial background, dietary habits, and heredity, have not been investigated, as they were considered beyond the scope and purpose of this survey. The primary objective of this report is to stimulate interest in artificial fluoridation. It is hoped that the result of this investigation may be of local value as preliminary data to a municipality undertaking fluoridation as a method of reducing the incidence of dental decay.

#### ACKNOWLEDGMENTS

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# The Public Health Importance of Domestic Flies and Their Control on a District Basis in Alberta

J. H. BROWN<sup>1</sup>, MARGARET H. O'MEARA<sup>2</sup>, M. L. FRIEND<sup>3</sup>  
and H. DEAN<sup>4</sup>

THE first organized domestic fly-control work in Alberta was carried on in Lethbridge during 1950 under the direction of Dr. Margaret H. O'Meara, medical officer of health. This program was designed to evaluate the effect, if any, of fly control on the incidence of common communicable diseases<sup>12</sup>.

In 1951 the Provincial Department of Public Health, through the assistance of the Dominion-Provincial Health Grants, made a power sprayer available to the city of Lethbridge on the understanding that a Fly Control District embracing the towns and villages of Taber, Raymond, Magrath, Macleod, Cardston, Stirling, Picture Butte, Coaldale, and Barons, would be established. The District was organized and fly-control work was started in May, 1951.

## I. DOMESTIC FLIES

The domestic fly complex contains the housefly, various species of blow and flesh flies, and representatives of many less common families.<sup>5, 9, 13</sup> Extensive samples<sup>11</sup> in two United States cities—one a part of a metropolitan area and the other surrounded by farmsteads—indicate that representatives of the families *Muscidae*, *Calliphoridae*, *Sarcophagidae*, *Drosophilidae*, *Scatophagidae*, *Otitidae*, *Lonchaeidae*, *Ansiopidae*, *Syrphidae*, *Tipulidae*, etc., are involved in the domestic fly complex in urban areas.

Extensive observations<sup>5, 9</sup> confirm the belief that the housefly (*M. domestica*) and several species of blowfly constitute 90 to 95% of the domestic fly population.

From these observations it may be assumed that in other areas where these flies occur they probably constitute, on the same basis, the local domestic fly complex. On examining the records of fly fauna for the Lethbridge district,<sup>4, 16</sup> the following species were found to occur:

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<sup>2</sup>Formerly Medical Officer of Health, Lethbridge; Now Mrs. F. Brink, Spokane, Wash.

<sup>3</sup>Sanitarian, Board of Health, Lethbridge.

<sup>4</sup>District Sanitarian, Alberta Department of Public Health, Lethbridge.

**MUSCIDAE**

*F. canicularis*  
*F. scalaris*  
*Hylemya* sp.  
*M. domestica*  
*M. stabulans*  
*M. mediotabunda*  
*O. leucostoma*

**CALLIPHORIDAE**

*C. elongata*  
*C. erythrocephala*  
*C. latifrons*  
*C. vomitoria*  
*C. cadaverina*  
*H. fulvicornis*  
*L. sylvorum*  
*P. sericata*  
*P. regina*  
*P. terraenovae*

**OTHERS**

**DROSOPHILIDAE**  
*Drosophila* sp.

**SARCOPHAGIDAE**  
*Sarcophaga* sp.  
*W. meigenii*

### *Life History and Habits of the Predominant Members of the Domestic Fly Complex*

In order to show the relationship of the predominant domestic fly species to environmental sanitation, a brief résumé of the life history and habits is given.

#### 1. Housefly (*M. domestica*)

Preferred breeding places are horse and cow manure, but garbage, kitchen slops, cannery and beet factory wastes, open septic tanks, decaying fruits, pig manure, decaying lawn clippings, etc., also provide excellent places. It should be borne in mind that any moist, warm and decaying organic matter is a potential source of housefly breeding. The elongate white eggs are laid in batches of 100 to 150 eggs each in or on the available medium. These eggs hatch within 8 to 30 hours into small, white, legless maggots or larvae which begin to feed on the medium. In from 5 to 14 days they complete their feeding and move to a dry part of the breeding place, where they form a small brown case or puparium within which the larvae change into the pupae. The pupal stage lasts from 3 to 10 days, after which the adult fly emerges. Fertilization of the female takes place shortly, and within 3 or 4 days after emergence (under favourable conditions) she begins to lay her eggs. Depending upon conditions, the span from egg to egg-laying ranges from 10 days to 3 weeks, with from 10 to 15 generations a year.

It is believed<sup>5</sup> that the housefly life-span during the summer varies from 30 to nearly 90 days. The adults will feed on a wide range of foodstuffs prepared for human consumption as well as on the materials used for breeding places. Although houseflies occasionally travel considerable distances, the general rule is for them to stay within 200 to 300 yards of their breeding places.<sup>5</sup>

#### 2. Blowflies (*Calliphoridae*)

Some of the flies in this family are known as blue- and green-bottle flies from the colored-glass appearance of the abdomen. The preferred breeding place is decaying flesh or animal matter, but human and animal excrement, and garbage, as well as meat, cheese, fats and other human provisions, are all acceptable.

The eggs hatch almost immediately into large white maggots which feed on the available medium. In a short time the larvae migrate to dry soil and pupate below the surface. The egg-to-adult period ranges from 9 days to 3 weeks, with 4 to 8 generations a year.

These flies often invade homes, particularly in spring and fall.

#### 3. Flesh flies (*Sarcophagidae*)

The eggs are hatched within the female and the maggot is deposited on the breeding medium. The habits are variable, with the maggots being deposited in wounds, as parasites in other arthropods, in decaying organic matter and in human and animal excrement.<sup>5</sup>

#### 4. Other Species

The Latrine fly (*Fannia scalaris*) and the Little housefly (*Fannia canicularis*) have similar life histories and habits, as both breed in human excrement and will invade homes. Most of the other members of the domestic fly complex breed in decaying organic material, including human and animal excreta.

## PUBLIC HEALTH IMPORTANCE

The status of the domestic fly complex in relation to public health has never been seriously questioned, as it has often been demonstrated that the members of the complex, through their breeding and feeding habits, are placed in a unique position in regard to the transmission of numerous, mainly intestinal, disorders. Furthermore, a number of workers<sup>1, 3, 7, 8, 9, 10, 11, 15, 17</sup> remark on the relationship of flies to sources of infection and the methods whereby the organism could be transmitted to man. The public health importance of certain families of the domestic fly complex, representatives of which are present in the Lethbridge district, is shown below:

Family	Disease or Condition
Muscidae	Transmit anthrax, cholera, dysentery, leprosy, trachina, typhoid, tuberculosis, etc., and protozoan, trematodan, cestodan and nematodan infestations. Also cause various types of myiasis.
Calliphoridae	Cause various types of myiasis. One species, <i>P. regina</i> , is a suspected carrier of poliomyelitis.
Sarcophagidae	Cause various types of myiasis.

The fact that the majority of the species breed in or feed on human and animal faeces and human and animal carcasses, as well as feeding on pus, vomit, etc., indicates that when they enter human habitations and contact the person of, or food and drink prepared for, the occupants, there is ample epidemiological evidence that they constitute a health menace, particularly in regard to intestinal conditions.

## II. THE LETHBRIDGE FLY-CONTROL DISTRICT

The fly-control district included the city of Lethbridge and the communities of Taber, Raymond, Magrath, Macleod, Cardston, Stirling, Picture Butte, Coaldale, and Barons (Fig. 1), as well as twenty-three of the dairy

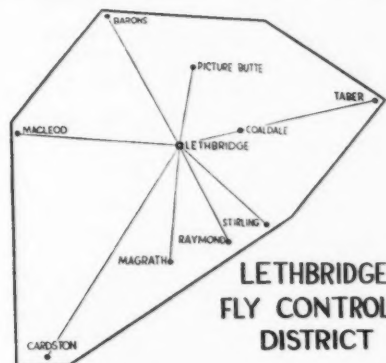


Fig. 1 (Alberta Government Photograph)

farms in the Lethbridge milkshed. As the control district is located in the irrigated area, the population involved is quite high. Table I records the communities and the population of each.

TABLE I  
Urban Areas and Populations

Place	Population (1951)
1. Lethbridge .....	22,947
2. Taber .....	3,042
3. Raymond .....	2,279
4. Magrath .....	1,320
5. Macleod .....	1,860
6. Cardston .....	2,487
7. Stirling .....	520
8. Picture Butte .....	865
9. Coaldale .....	806
10. Barons .....	369
TOTAL .....	36,485

### Type of Area

Although all of the localities treated, with the exception of Barons and Macleod, are within the irrigated district, there is a considerable variation in the kind of activity pursued and the type of environmental sanitation in force. The following is a brief résumé of the activities and sanitary conditions in each locality.

1. *Lethbridge*. This is a city of some 23,000 persons. Like all cities, it has been experiencing a boom, and a tremendous number of new homes have been built in various sections of the city. Furthermore, the city utilities have been taxed to the utmost to supply the basic sanitary facilities.

Until recently, a considerable number of pit and box privies were in operation on the outskirts of the city. Besides those a large number of outlying homes maintained domestic animals and poultry.

As it is an agricultural centre, it has a large stockyard, a pig-feeding plant, an abattoir, a cannery, and various other places conducive to fly breeding.

2. *Taber*. This is a flourishing town with a sugar refinery, canneries, pickle factories, and other allied agricultural products processing plants. The sanitary conditions are not good. A sewage disposal plant is in the process of being developed, but a large number of homes depend on septic tanks and privies. The garbage collecting is a sketchy process and the town dump is open.

3. *Raymond*. This town also has a sugar refinery. Garbage collecting and sewage disposal are in the process of being developed, but bad sanitary conditions exist in various parts of the town. Some livestock feeding is done and a considerable number of the homes maintain cows and poultry.

4. *Magrath*. A vegetable cannery operates here. The sewage disposal and garbage collecting have not developed very far; septic tanks and pit privies are very common. Cows and poultry are maintained by practically all householders.

5. *Macleod*. The main part of the town is served by sewage and garbage collection, but the outlying parts depend on privies and septic tanks. Some livestock is kept within the town boundaries.

6. *Cardston*. This is the Temple City of the Mormons and is located on Lee's Creek. The garbage collection and sewage disposal systems are being extended, but the majority of the homes depend on septic tanks and pit privies. A large number of householders maintain livestock and poultry. A dairy farm is established on the outskirts of the town.

7. *Stirling*. This village has only rudimentary sanitation, with privies, livestock and poultry present on practically every lot.

8. *Picture Butte*. A large sugar refinery and livestock feeding are the main endeavours in this area. Sanitation is sketchy.

9. *Coaldale*. This village supports a cannery. Sewage disposal and garbage collection systems are being developed. Livestock and poultry are common in the village as well as on numerous small irrigated holdings surrounding it.

10. *Barons*. This is a typical dry-land farming village with the usual complement of fly breeding places.

### III. FLY-CONTROL PROGRAM

With the exception of Lethbridge, none of the places had ever undertaken an organized fly control campaign. After the local council had agreed to participate in the program, a survey of each town was made and the prominent fly breeding and resting places marked. Visual fly counts and grid counts<sup>14</sup> were made and the relationship of breeding areas to fly concentrations was noted.

#### *Organization*

The program was established under the Lethbridge Board of Health, with the Provincial Department of Health supplying a power sprayer from Dominion-Provincial Health Grants. After discussion with the representatives of the local councils of the towns and villages of Taber, Raymond, Magrath, Macleod, Cardston, Stirling, Picture Butte, Coaldale, and Barons, it was agreed:

1. That a charge of \$50.00 per diem would be made for the spraying service.
2. That this money would be paid to the City of Lethbridge.
3. That the Lethbridge Board of Health would provide: the power sprayer, the operator, the insecticide, maintenance and repair of the equipment, and assistance in locating fly breeding and resting places and evaluating degree of control outside of Lethbridge.
4. That each town or village would provide traction for bringing the power sprayer to it and while the campaign was in operation.
5. That the Provincial District Sanitarian would assume the responsibility for the control campaign outside the city of Lethbridge.

#### *Materials*

A No. 161C1300 Hardie power sprayer with a 150-gallon tank, and equipped with springs and shocks, axle and 6.50 x 16 wheels, tires and tubes, 5 HP engine, two 201 A guns, one 4-nozzle gun, two 50' hoses, one 100' hose, one hose swivel, two line strainers, and one live hose reel was used. This machine was modified by having a step welded on to the back and the outlet control valves moved up to the top of the tank. A 4-nozzle broom spray was fixed to the left-hand side of the tank while 200 feet of hose was attached to the right-hand side. The fixed broom spray was for treating one side of the alley while the operator treated the other side with the nozzle of the hose. The hose also facilitated treatment of privies, etc. The outfit was pulled by a small tractor or pick-up truck.

The spray material was 50% Wettable DDT, reduced to 5% DDT in water.

#### *Methods*

In the city and larger towns the machine travelled up and down the lanes, spraying the fence lines, garages, garbage cans and backs of buildings adjoining the lanes<sup>1</sup>. Where necessary<sup>2</sup>, the machine was stopped and by means of the hose the operator thoroughly treated all fly-breeding and resting areas.

In villages individual privies and accumulations of rubbish and garbage were thoroughly sprayed.

Particular attention was observed in treating refinery and cannery wastes, feed lots, stockyards, piggeries and garbage dumps, so that an effective control could be had.

On dairy farms only the breeding and resting places outside the dairy barn were treated.

The 5% DDT in water was applied as a residual spray at the rate of one gallon per 1,000 square feet.

### *Results*

In accordance with a pre-arranged schedule, the campaign got under way at Macleod in May and, working counter-clockwise, returned to Lethbridge, completing the first treatment by late July. The second spraying was started in August, and Macleod, Cardston, Stirling and Raymond were completed. Then rains and snow set in and the machine was brought to Lethbridge where, during clear weather, about three-quarters of the city was sprayed.<sup>6</sup>

During the course of the campaign the dairy farms adjacent to the various towns and villages were also treated. A total of twenty-three such farms were thoroughly sprayed.

The effectiveness of the control was evaluated by visual observations and grid counts. It was estimated that, despite the unfavourable conditions prevailing during the campaign, an excellent control was achieved. However, it was amply demonstrated that the control of domestic flies is directly related to environmental sanitation and that chemical control is only an aid.

### SUMMARY

Domestic fly control on a district basis makes the use of power equipment and trained personnel available to even the smallest of communities because the cost is so low that no community can afford to reject it. Furthermore, the inception of a fly-control campaign awakens the citizens to a realization that chemical control is only an aid, with good environmental sanitation being the only sensible way to cope with a domestic fly problem.

The majority of the species present in a domestic fly complex are known or suspected carriers of various human diseases. Hence, it is assumed that their reduction would tend to reduce the incidence of certain communicable diseases. The Lethbridge and District Fly Control Program has not been in existence long enough to justify any conclusions in this regard, but it is expected that interesting information on this subject will be available in five years.

The cost of the fly control campaign was approximately six cents per person.

### ACKNOWLEDGMENTS

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heartedly supported the control program; Mr. W. O. Mills, Factory Representative, who assisted in modifying and checking the spray equipment; and all those others who assisted through various ways in making the program a success.

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Letter from Great Britain

## Feeding Britain Tomorrow

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Dear Editor,

FROM the moment when Frederick Gowland Hopkins (in 1907) first pointed out the existence of 'accessory food factors' until the outbreak of World War II, intensive studies of food and food habits were conducted in Britain and elsewhere. Dietary surveys conducted during the 1930's made it obvious that the full value of the many vital essential nutrients, of which so much had been learned in the previous quarter of a century, was denied to many. The fact that essential nutrients occurred mostly in the expensive foods meant that they were absent from the diet of families whose budgets were constricted by the demands of growing children, just at the time when most needed. As this new knowledge of nutrition became widely known, there grew up a widespread belief that some remedial action was needed. Little was done before the second world war began, but once this was upon us, the whole nation readily accepted a revolutionary scheme of national feeding.

History probably knows no greater example of a controlled experiment in biology than that conducted by Britain in the scientific feeding of her peoples during and after World War II. For more than a decade production, purchase, and distribution of food, controlled to provide everyone with at least a minimum of energy requirements, has been directed towards an adequacy of essential nutrients according to biological needs. Foods that have been too expensive for restricted purses have been heavily subsidised; those that are essential to the growth of the young and necessary for healthy gestation have been further reduced in price to these priority classes. The needs of the worker and the school child have been satisfied by the planned meal made available in gargantuan amounts. The Ministry of Education today is the largest catering establishment in the country, supplying daily three million meals. Industrial canteens probably supply as many more. Vitamins for the young and the pregnant have been issued in tons, and, if not always consumed by the right persons, these must have improved the delicate growth processes of this section of the nation, upon which the future depends. Foods have been fortified with vitamins and minerals. The wheat grain has

been scientifically extracted and made available to all with enough of its rich sources of aneurin, iron and lysine still intact. Milk has been appreciably increased in amount and redistributed, and in consequence its incomparable sources of calcium, to which national health must owe so much, and the finest protein, which it contains in large amounts and upon which growth and vitality largely depend, have permeated the whole of the nation's tissues. Essential nutrients have not, as before in this country and so commonly elsewhere, been available only to the few.

No one knows the exact effect of so much and so widespread scientific feeding. The whole vast experiment has been applied coincidentally with other social measures, so that the apportionment of benefits is not easy to make. Nevertheless, evidence that the food policies of the past eighteen years have resulted in a general improvement of health is sufficiently strong for all those interested in the health of the community to watch with some concern any new departures. Much of the sanction for this operation has been supplied through wider motives, the stringency of war and the post-war disturbance of national economy. Much of its detailed operation, e.g. rationing, hardly accords with British beliefs in liberty of action. It has always been inevitable that the change from a war-time economy would bring changes in the management of our food resources. If we wish to retain and even extend the advantages of the last fifteen years, it is time to ask ourselves how we are to achieve the same ends by different means.

The easiest way to examine the problem is to assume the abandonment of all our measures to feed biologically. We can then see how machinery can be built up to ensure the maximum protection with the minimum interference with liberty, economy and privilege. When food subsidies have been abandoned, meat, milk, eggs—most of the protective foods—will once again cost too much, particularly for the young growing family, whose need for them is greatest. Even if rationing were to be retained, food would again be rationed by price; indeed, the final departure from rationing would pass virtually unnoticed except for the cheaper sugar, increased use of which would further upset the balance. Priority issues would not be available to offset any of these disadvantages. With these suppositions fulfilled, we would have returned to our pre-war feeding without all the abundance of those days. We should ask ourselves what steps can be taken, other than general food subsidies and rationing, to ensure that food, in the correct amount and with enough protective properties, is consumed by all, including those most likely to suffer deprivation.

The considerations which should guide us are as follows:

(a) First is the national purchase of food. We need to remember that the area of land available to us even with the most scientific farming can nourish only half of our 52 million people. We must inevitably remain large importers of food. We should aim to continue and even improve the 2,750-calories diet which has successfully carried us through the past fifteen years. But some selection and restriction of imports is clearly inevitable so long as the present balance of trade operates. We can safely restrict the imports of meat and sugar.

(b) One of the main essentials is for a good bread. Extraction of the wheat grain below 85% is accompanied by damaging loss of essential nutrients, e.g. aneurin, available iron and lysine. The use of a 70% extraction white flour heavily fortified, as in the U.S.A., is a less desirable alternative because of the complex nature of the wheat grain and its constituents, particularly among the vitamin B group. We may put back a lot but we can hardly replace everything.

(c) Priority issues at cheap rates for expectant and nursing mothers, the young child and the school child, will be our next line of defence. Vitamins, cod liver oil and orange juice should be available to the expectant and nursing mother, as now. The widespread incidence of anaemia, coupled with our present knowledge of the iron metabolism, supports the addition of iron to the list of supplements.

Milk should be made available at cheaper rates to those who require it for the maintenance of growth; our aim should be at least a daily rate of a pint a head for all children and rather more during pregnancy and lactation. The present allocation of cheap milk to expectant and nursing mothers, children under five and school children must continue and gradually be increased as supplies improve; the distribution should be extended to the working adolescent in industry and those in full-time education to the end of university life. Every effort is needed to extend milk production, including the preparation and importation of dried milk. Our eventual goal should be to extend milk drinking throughout the whole nation.

Eggs could, with advantage, be treated in the same way, so that the expectant and nursing mother receives at least two fresh eggs a week or the equivalent in a dried form. Authorisation for priority milk and eggs could be issued at maternity and child welfare centres. A National Dried Milk should be continued as a means to ensure that surplus supplies of milk can be conserved and sold at cheap rates; it should be fortified with vitamins A and D and iron.

(d) Drying and preservation of all protective foodstuffs (of which supplies exceed demand at intervals) should be further encouraged. This should include fish, fruit and vegetables. Fortification of foods with essential nutrients must be continued and extended as new knowledge suggests. Fortified margarine, as its texture and taste are improved, can progressively replace butter and so prevent the waste of butter milk which usually accompanies butter production.

(e) The provision of planned meals on a national scale should be increased beyond the present level. Meals in schools can with advantage be extended gradually to become a universal measure. Industrial canteens for the worker should be developed and extended. 'Meals on Wheels' should be made general to meet the needs of the old people living alone or in adverse social conditions. The planning of meals is in need of more study. We are still ignorant of the need of many workers in the varied conditions of modern industry.

(f) Lastly, we must strive for a careful balance of the diet particularly in the young growing family where economic considerations must continuously operate to upset it. When a national scheme of education in food values is no longer operated, as it has been so long and successfully by the Ministry of

Food, other means must be found to stimulate public appreciation of diet in relation to health. The Health and Education Departments of Local Authorities should co-operate to make this an important part of their services; teachers, health visitors and family doctors should carry on the work so ably begun.

Food subsidies have been at their best only a rough-and-ready means of insuring adequate subsistence for the people. Now that the nutritional needs of the various elements of the population are more fully understood, the time has come for a careful study of the cost of replacing them by extended schemes of food allocation such as are outlined above.

## Administration and Methods of Enumeration of the Sickness Survey in Saskatchewan

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IN Saskatchewan during the past six or seven years, as in other provinces, considerable progress in the development of public health and health services programs has taken place. In preparing to launch new services and extend those already established, careful planning and much thought is required. Those who have assumed the major responsibility for setting forth along new pathways have recognized the need for accurate quantitative information with which policies can be more objectively formed. The paucity of information which measures the length and breadth of illness among the people is keenly felt. When we consider, as an example, the imposing problems to be faced in preparing a sound and generally acceptable system of health insurance, we recognize that filling in this gap in our knowledge is of utmost importance.

Data which are being currently collected are not sufficiently complete nor comprehensive to provide a basis upon which the health needs of the people can be determined. Communicable-disease reporting is incomplete. Extending this compulsory reporting procedure to such a disease as cancer would probably not work out too satisfactorily—although in Saskatchewan about 85 per cent of new cancer cases each year are seen at provincial cancer clinics. Information on accidental injuries from the Workmen's Compensation Board or on the health of school children from school health records shows serious gaps when subjected to any intensive analysis.

During the postwar years, a large volume of data has been assembled in Saskatchewan as a result of the operation of publicly controlled medical and hospital care insurance programs. Thus the records of the Saskatchewan Hospital Services Plan provide information on hospitalized illness of over 90 per cent of the population. The health services program for recipients of social assistance yields data on medical, dental, optical and other kinds of care received by this special group. The records of the Swift Current program of prepaid medical care provide us with a measure of the care received in one geographic area as well as the types of illness for which these residents seek medical attention.

When the National Sickness Survey was projected, the Department of

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Presented before the Vital and Health Statistics Section at the fortieth annual meeting of the Canadian Public Health Association, held in the Fort Garry Hotel, Winnipeg, June 16-18, 1952.

Public Health in Saskatchewan welcomed this opportunity to obtain a broader picture of illness, both treated and untreated, and to collect other essential items of knowledge which such a survey would provide. It was undoubtedly wise to have chosen the periodic incidence type of survey, which gives us a much clearer picture of acute short-term illness,<sup>1</sup> even though more work was involved in this approach.

Undoubtedly a national sickness survey could not be undertaken in all of the provinces simultaneously without the organizational and technical leadership provided by the Department of National Health and Welfare and the Dominion Bureau of Statistics. Preparing standard enumeration procedures, creating uniform records and forms, and drawing the random sample were essential for a successful provincial survey. Once the federal agencies had laid this groundwork, the province could proceed with the actual field enumeration.

The major responsibility for directing survey activities in Saskatchewan rested with the Research and Statistics Branch of the health department. The Division of Health Education, health officers, public health nurses and others aided in interpreting the survey to the general population. The organized medical profession co-operated fully in assuring the willing participation of any of their patients who had been chosen in the sample.

The director of the Research and Statistics Branch, among his other duties, acted as survey director. He maintained liaison with the federal agencies, gave overall direction to the survey within the province, and supervised the work of the survey supervisor.

The survey director was successful in recruiting a supervisor who had had the necessary general training and experience suitable for this position. In addition, our survey supervisor had the ability to establish good public relations, could drive a car, and was willing to travel in rural areas during unfavourable road and weather conditions. She undertook the responsibility for recommending the appointment of enumerators and for giving them a clear understanding of the purpose of the survey and of its procedures. It was her task to map the location of households in the primary sampling units and to apply the sampling ratios to select the households to be enumerated. Throughout the course of the survey it was her responsibility to maintain frequent contact with the enumerators and to assure that records were completely and accurately kept.

Because of the decision to draw a special sample representative of the Swift Current Health Region, to which reference will be made later, the selection and appointment of field enumerators was postponed until the latter part of July, 1951. However, the task of selecting 36 enumerators scattered throughout the entire province was completed within approximately five weeks, so that the first visits could be made by enumerators before September 1. Only one enumerator had to be replaced during the survey due to illness. A qualified successor was found so that continuity was maintained.

The enumerators included 4 farmers, 7 housewives, 11 teachers, 3 nurses,

<sup>1</sup>Emerson, Haven: Administrative Medicine. New York: Thomas Nelson & Son, 1951, p. 515.



5 municipal secretaries, 4 clerks, 2 postmasters, and 2 salesmen. Of the total group 14 were males and 24 females. The majority of them were young adults aged 30 to 39, although a few were under 30 years of age and some more elderly, including one over 70 years.

The selection, appointment and training of enumerators was, of necessity, carried out rather hastily. On the whole, the impression was gained that the best qualified person available to undertake the work of enumeration was the one originally appointed. In organized health regions in the province, the medical health officer was consulted and gave advice regarding the persons who would be suitable for these positions. In towns, villages and rural areas outside the health regions, the advice of the town clerk and municipal secretary-treasurer was sought. In certain other areas the Labor Force enumerators employed by the Dominion Bureau of Statistics were appointed.

The schedule for training enumerators was likewise speeded up. Initial orientation was given at the time of the appointments and further intensive training was given in the month of September or before the enumerator had made the second visit in October. Throughout the survey year the supervisor made frequent visits to all enumerators, occasionally accompanying them on their visits to families, thus providing a form of on-the-job training. It was not possible to conduct group instruction because of the delay in the initial appointment of the enumerators.

No attempt will be made in this paper to discuss the sample design in detail. According to the Bureau of Statistics, the random sample originally drawn for Saskatchewan appeared to be representative of the entire province. The metropolitan areas of Regina and Saskatoon, a number of other urban centres, small villages, and rural areas were included. However, in the entire provincial sample, there were only 22 households selected in the Swift Current Health Region. It is in this region that all the residents are covered by a comprehensive health insurance program. It was therefore considered highly desirable to select a sample of households in the Swift Current area sufficiently large to enable the drawing of valid comparisons with the data obtained from the rest of the province. At the same time it would allow us to relate the sickness-survey data to the data obtained in this health region on medically treated illness. When this suggestion was transmitted to the Department of National Health and Welfare, it was readily endorsed and the second sample was drawn by the Dominion Bureau of Statistics. Forty primary sampling units were selected in the second sample, of which 13 were in the Swift Current Health Region.

The identification of households in the metropolitan sampling units of Regina and Saskatoon and in four other urban units was carried out by using the Labor Force sample previously selected by the Dominion Bureau of Statistics. In the other sampling units, the provincial survey personnel prepared maps of all rural and urban units on which all households were located and numbered. To facilitate interviewing in the rural areas, "cluster sampling" was utilized, a procedure of selection which tended to group the households, thereby reducing the travel distance of enumerators. This task of mapping towns, villages, and rural areas was considerably facilitated by the co-

operation of numerous agencies and officials, including the Community Planning Branch of the Department of Municipal Affairs, the Engineering Department of the Saskatchewan Power Commission, city and town clerks, and secretary-treasurers of rural municipalities. The municipal officials provided not only official maps but also up-to-date information on multiple-dwelling units and on other matters essential in carrying out the field work.

Because of the impossibility of maintaining contact with households throughout the winter in two isolated areas, the Dominion Bureau of Statistics selected two other rural areas to replace them. After discounting 35 permanently vacant dwellings, the sample produced a potential total of 718 households. An indication of the co-operation of the families selected in this province is seen by the fact that only three refused to participate, resulting in a refusal rate of 0.4 per cent.

The enumeration methods which were followed in this province were those prescribed in the Manual of Instructions and other material prepared by the Department of National Health and Welfare. There was only one major problem during the survey, that of maintaining regular monthly contact with rural families isolated during the winter months. The winter of 1950-51 was unusually prolonged, and while some enumerators were able to drive their cars throughout the winter, others required the use of teams and sleighs. Several missed only alternate months of interviews, while a few were unable to make personal visits from February to April.

These gaps were filled by the use of personal letters or telephone calls reminding the household informants to mark their calendars; by sending duplicate copies of the calendars from which the enumerator wrote the information on his record cards; by sending other material about the survey in order to maintain the household informants' interest; and by letters from the supervisor to assist the enumerator in maintaining a continuing interest. Provided the interest of the informant was kept up and all the necessary information recorded on the calendar, it became a relatively easy matter to check back at a later date. The use of the family sickness calendar as far as Saskatchewan was concerned was of very considerable value.

In Saskatchewan it was decided that the best method for assuring the quality and accuracy of recording the required information was through the direct personal supervision of the supervisor. Personal visits were maintained throughout the year, and only during the month of March, when travel conditions were at their worst, were these visits suspended. When it was impossible to make a personal visit, it was considered desirable that the enumerator should send in his records by registered mail. These were examined by the director and his supervisor and returned with notes regarding any modifications or additions that would be required. Because of the scattered distribution of the enumerators it was not considered practicable to hold group conferences. It was our feeling that this continued supervision of the work of the enumerators was most effectively carried out by frequent personal visits by the survey supervisor.

Considerable thought was given to the method of re-enumeration as a method of checking on results. However, this was not undertaken because of

the belief that it would destroy much of the high morale of the enumerators and perhaps result in some loss of co-operation of the household informants.

The verification of all diagnoses was carried out for the first four months of the survey, from September through December of 1950. Rather than visit the family physicians, it was decided to have the survey records of diagnoses checked against the statistical records of two health services programs in Saskatchewan. These were the medical records of the Swift Current medical care program and the hospital discharge records of the Saskatchewan Hospital Services Plan. All diagnoses of cases seeking medical and hospital care were verified for the Swift Current sample and only the diagnoses of the hospitalized illness for the rest of the province.

In undertaking to verify the reporting of illnesses in this way, it was imperative to maintain the secrecy surrounding the use of such information. Accordingly, duplicate copies of the individual sickness records were submitted to the statistical sections of these two plans, and the conformance or non-conformance of the enumerator's record with the statistical record was indicated. In this way, no information was transmitted and the requirements of secrecy were preserved. In addition to checking the accuracy of diagnoses, it was also possible to determine the accuracy of the reporting of such information as length of stay in hospital, number of physicians' visits, and so forth.

Results of the verification procedure were very gratifying, indicating that the household informants were withholding or omitting very little information and that details were being accurately recorded by the enumerators.

The performance of the individual enumerators was evaluated by the survey supervisor in accordance with the performance rating scale prepared by the Research and Statistics Branch. In general, the enumerators of both sexes, coming from many walks of life and usually without previous experience, performed their tasks satisfactorily. According to the performance scale, 17 enumerators rated very good, 11 rated good, and 10 rated fair. The rating scale is designed to measure aptitude, application, and the maintenance of records. Of the total possible score of 30, the nurses obtained the highest average score with 25 points, while the salesmen were at the bottom of the scale with an average of 18 points. Those in the age group 40-49 showed the highest average performance rating.

The performance of the enumerators was also analyzed in a somewhat different manner. This was done by computing the average number of illnesses (preliminary tabulation) per person surveyed as recorded by the enumerators according to the age, sex, and previous occupation of the enumerators. It is not possible to derive any firm conclusions from this analysis, although some of the results are of some interest. There is little difference between the number of illnesses per person as recorded by male or female enumerators, although in the age group under 30 in both sexes the number of illnesses recorded were somewhat lower than in the older age groups. When analyzed by occupation, the average number of illnesses ranged from 5.6 per person as recorded by farmers to 2.8 per person as recorded by salesmen. Enumerators in the metropolitan areas recorded a larger number of total illnesses per

person than those in the smaller urban centres, while the smallest number were recorded by enumerators in the rural municipalities.

In assessing the work of enumerators, considerable thought was given to the possibility of over- or under-reporting of actual illnesses during the first two or three months when the enumerators were still new on the job and informants still not certain of how little or how much illness should be recorded. When the verification of diagnoses was carried out, it was found that only in a few cases were certain personal illnesses or trivial conditions not reported to the enumerator, particularly during the first month of the survey.

At the close of the survey a preliminary tabulation of new, continued and recurring illnesses by month of occurrence was carried out. The seasonal variation of new illnesses, with the greatest numbers occurring during September to February, and the small amount of variation in the incidence of continued illnesses, is similar to the experience seen in the National Health Survey in the United States and the Survey of Sickness in Great Britain. It was considered likely therefore that no serious variation is present in the illness records for the first two or three months which could be ascribed to over- or under-reporting.

Throughout the sickness survey as conducted in Saskatchewan, various methods were employed to stimulate and maintain family interest. Before the survey commenced, radio and newspaper publicity was used. Special releases were prepared for the specific newspaper covering each area selected in the sample in order to stimulate their sense of local pride and at the same time to explain the objectives of the survey and the confidential nature of the survey information. Later a letter was sent from the director to every household selected in the entire sample.

As the survey progressed, additional material was sent to the householders, including reprints of provincial and federal articles, special letters, and Christmas cards during the holiday season. At the close of the survey, a letter of thanks was sent to each household by the deputy minister. While this approach was of considerable importance, it appears that the primary requisite for gaining the sustained co-operation of the households was the friendly, interested attitude on the part of the enumerator. This in turn was dependent upon the attitude and working relationships which the survey supervisor was able to establish.

The total cost of the sickness survey in Saskatchewan was \$21,606. The cost per family surveyed was \$28.69; the cost per person surveyed, \$7.69; and the average cost per visit, \$1.67.

This brief review of the administration of the sickness survey in the Province of Saskatchewan demonstrates that an incidence type of morbidity survey involving periodic visits is practicable even for a rural province with a scattered population. The results of the survey will be awaited with keen interest and should prove to be a valuable addition to our knowledge of the health of the people.

# Trichinosis in the Vancouver Area

## EXAMINATION OF 400 HUMAN DIAPHRAGMS

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THE SERIOUS NATURE of trichinosis has been realized since 1860. Since that time much research has been directed towards its control and numerous surveys have been carried out at various points in the world to determine the incidence of this nematode infection. Until the time of the present investigation, however, only two such surveys, by Cameron<sup>1</sup> and Kuitunen-Ekbaum<sup>2</sup>, have been carried out in Canada, and both of these were concerned with eastern cities. The present study was undertaken to determine whether or not trichinosis constitutes a medical problem in Vancouver, British Columbia.

### Natural History

The life cycle of the causative agent, *Trichinella spiralis*, occurs within the body of a single host and is the same regardless of host species. Infection takes place when meat containing encysted larvae is ingested. Excystment occurs in the stomach in a few hours, after which the larvae migrate to the small intestine, where maturation and copulation take place. The females burrow into the intestinal mucosa, where they each give birth to some 1,500 living young. The newborn larvae enter the lymph spaces and proceed by way of the blood stream to striated muscle tissue, where they assume a spirally coiled position and soon become enclosed in a double-walled capsule. The encysted nemas may remain alive for many years, and are capable of producing infection if introduced into another host. A calcification process usually takes place in which the cyst wall, larvae, or both, become calcified. *T. spiralis* shows preference for certain sites of encystment; active muscles with a generous blood supply such as the diaphragm, intercostal, laryngeal, tongue, and eye muscles have been found to be more heavily infected than less active muscles.

### Genesis of Human Infection and Control

While bears have been transmitters of trichinosis, the vast majority of human cases are attributed to the eating of infected pork. Hogs in turn develop trichinosis when infected pork scraps are included in their swill, and

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perhaps to a degree by eating infected rats, although the latter possibility has been minimized by many writers. However, the 33.3 per cent incidence found by Moynihan and Musfeldt<sup>6</sup> in rats from Vancouver piggeries suggests that this type of transmission may be more common than is realized.

Control measures are based on the fact that *T. spiralis* may be killed by heat or cold. Legislation is in force in Canada calling for (a) the cooking of all garbage to be fed to hogs, and (b) the treatment by heating, freezing, or salting of all uncooked pork intended for human consumption. Final control rests with the cook, for only pork which has been cooked thoroughly may be deemed safe.

### Methods

Because of the site of infection mentioned above, and the desire to make the present survey consistent with previous ones, the writer chose diaphragm tissue as the medium for examination. Accordingly, specimens from diaphragms of humans were collected twice weekly at the Vancouver General Hospital, St. Paul's Hospital, and Shaughnessy Hospital, all in Vancouver. These tissues were examined by both direct compression and digestion techniques.

The compression method consisted of an examination of one gm. of tissue which was teased apart, squeezed between glass plates held in a brass frame, and inspected under the binocular microscope X45.

The second technique involved digestion of ten gm. of chopped muscle in 0.2 per cent solution of pepsin in 0.01 Molar HCL, and subsequent use of a Baermann apparatus. In each case the bottom 30 c.c. of digest residue was drawn off and examined microscopically.

### Results

Of four hundred diaphragm specimens examined, 16, or 4 per cent, were found to have *Trichinella* cysts. This figure remained consistent throughout the survey inasmuch as the successive groups of 100 contained 4, 3, 4, and 5 positive tissues respectively.

Theoretical range of the incidence was calculated using the method suggested by Simson and Roe<sup>9</sup>, who state that such a range will be represented by  $M \pm 3a$ , where  $M$  is the mean and  $a$  is the standard deviation. The latter value was found to be 0.99 by using the formula of Ricker<sup>8</sup>,  $a = \sqrt{npq}$  where  $n$  is the total number of cases,  $p$  is the percentage positive, and  $q$  is the percentage negative. By applying the value 0.99 to the first formula, a theoretical range of 1.03 per cent to 6.98 per cent was determined.

Nine of the positive cases were discovered by the compression method only, while the remaining 7 were detected by both techniques. This discrepancy may be explained by the fact that live larvae were found in only 3 of the 16 positive tissues. The remaining 13 positive cases showed larvae which were dead or atrophied, and cysts which exhibited varying degrees of calcification.

The intensity of infection varied from 0.2 to 70 cysts per gram of tissue. Fourteen of the 16 positives harboured less than 50 cysts per gram of muscle.



## DISCUSSION

The work of Evans and of Walker and Breckenridge (in Kerr et al.<sup>4</sup>) has shown that up to 10 per cent of positive cases may be missed if only diaphragm tissues are examined. Furthermore, Jacobs (in Kerr et al.) has demonstrated that certain positive cases may be missed by using small samples such as the one-gram portions used for compression in the present study. Thirdly, Gursch<sup>3</sup> has shown that the viability of *Trichinella* larvae is reduced by peptic digestion of longer than 12 hours' duration. Thus it seems not unlikely that larvae may have existed in some of the tissues, and not have survived the 36-hour digestion used in this survey.

Taking into consideration all the aforementioned channels by which some positive cases may have escaped notice, the author feels justified in presuming the incidence of human trichinosis in the Vancouver area to be somewhat above 4 per cent.

Cameron has shown an incidence of 1.5 per cent in Montreal, and Kuitunen-Ekbaum demonstrated 1.75 per cent in Toronto. Why, then, is an incidence of 4 per cent or higher indicated in Vancouver?

Two possible solutions present themselves. First of all, the finding of 7.1 per cent positive cases in garbage-fed hogs near Vancouver by Moynihan and Musfeldt<sup>7</sup> leads to the conclusion that many human cases probably develop as a result of eating improperly cooked, locally raised pork. Secondly, the geographical position of Vancouver is such that most of the inter-city travel is directed south across the international boundary. Since an incidence of 17 per cent in humans occurs virtually all across the United States, according to Gould<sup>2</sup>, a large number of trichinous meals are doubtless consumed in that country, and it seems possible that some of these may be eaten by Canadian visitors.

## CONCLUSIONS

The 4 per cent incidence demonstrated by this survey points to the desirability of a control program involving public education with particular reference to the cooking of pork, and secondly a program of close inspection of hog feeding and rodent control at the piggeries near Vancouver.

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## Salmonella Types in Canada

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IN 1947, Ranta and Dolman<sup>1</sup> reviewed the reports on Salmonella types isolated in Canada and summarized the results of typing 317 cultures received at the Canadian Salmonella Centre in Vancouver, B.C., during the years 1945-47. Since then, more types have been found and it has become increasingly clear that the reservoirs of Salmonella infections are both numerous and varied. In any country where the health of the people is of national concern, a Reference Centre, at which cultures can be identified serologically, provides an important tool in finding sources of infection. Public health officers, laboratory workers and veterinarians are all needed in the search for these organisms and their combined efforts would greatly aid in a fuller understanding and control of the problem of Salmonellosis.

Because of the need for such a Reference Centre, it was in 1947, at the annual meeting of the Technical Advisory Committee on Public Health Laboratory Services,<sup>\*</sup> that a resolution was passed requesting the establishment of a Salmonella Typing Centre at the Laboratory of Hygiene. In 1948 this laboratory was unanimously accepted by the Committee as the National Salmonella Reference and Typing Centre for Canada. The objectives of this Centre were to provide a service open to all provincial laboratories for the serological identification of Salmonella cultures and to report the incidence of different types periodically to the Laboratory Directors.

The first cultures arrived at the Centre in November 1948 and since then reports have been submitted regularly to the Technical Advisory Committee at its annual meetings. This report summarizes the findings of this Centre to date (October 31, 1952).

Table I shows the Salmonella types, isolated from man, which were received from the provinces during the period November 6, 1948, to October 31, 1952. Each number in the table represents an isolation from a separate individual; repeat isolations of the same type from the same person are not included. All the provinces, with the exception of Ontario, submit to this centre most of the Salmonella cultures isolated in their laboratories from new cases. The Ontario Department of Health does not submit cultures to this Laboratory as it has its own Salmonella typing centre under the very capable

<sup>\*</sup>This Committee consists of the Directors of Laboratories of each of the Provincial Departments of Health, the Director of Laboratories of the Department of Veterans Affairs hospitals, and representatives from the Department of National Health and Welfare and the Department of National Defence under the chairmanship of the Chief of the Laboratory of Hygiene.

TABLE I  
SALMONELLAE (ISOLATED FROM HUMAN SOURCES) IDENTIFIED AT THE LABORATORY OF HYGIENE, OTTAWA,  
NOVEMBER 6, 1948, TO OCTOBER 31, 1952

Group	Type	PROVINCE OF ORIGIN										TOTALS	%
		B.C.	Alta.	Sask.	Man.	Ont.	Que.	N.B.	N.S.	P.E.I.	Nfld.		
A.	S. paratyphi A	1					2					3	0.2
B.	S. paratyphi B	43	25	10		1	147	2	19	1	8	267	24.2
	S. saint-paul	1										1	0.09
	S. typhi-murium	202	37	24	3		56		4		1	327	29.6
	S. derby	5	1									6	0.5
	S. san diego	2					3					5	0.4
	S. heidelberg	2	3									5	0.4
	S. wien						1					1	0.09
	S. californica	1										1	0.09
	S. bredeney	7					5					12	1.1
C.	S. paratyphi C		1				1					2	0.2
	S. cholerae-suis								1			1	0.09
	S. montevideo	2	1	1			9					13	1.2
	S. thompson	8					8					16	1.4
	S. potsdam	4					1					5	0.4
	S. oranienburg	30	8	6	2		6		2			54	4.9
	S. bareilly	12	4				4					20	1.8
	S. tennessee	4	2				12		3			21	1.9



direction of Miss Vera Crossley, hence the incidence of *Salmonella* types isolated in Ontario is considerably higher than that indicated in the table. The Ontario Laboratories, however, report their *Salmonella* isolations periodically to the Technical Advisory Committee.

The figures given in Table I do not show the true incidence of human Salmonellosis in Canada. The Dominion Bureau of Statistics<sup>2</sup> for the period under investigation—November 5, 1948, to October 18, 1952—reports the incidence of "typhoid and paratyphoid fevers" as shown in Table II.

A total of 2,500 cases is reported. A study of the reports from Ontario and Alberta, which were available to us, for a couple of years during this period of observation, indicated that "cases of typhoid and paratyphoid fevers" reported by the Dominion Bureau of Statistics, represent from 30-60% of the total number of cases from which *Salmonella* were isolated in their laboratories. Neglecting entirely the large number of cases of mild gastro-enteritis, due to *Salmonella*, which never come to the attention of the physician or the laboratory, it can be conservatively estimated that there must have been at least 4,000 cases of Salmonellosis in Canada during this period. Salmonellosis is, therefore, a problem of more than mere academic interest. From these 4,000 probable cases, we received<sup>1</sup> 1,102 cultures (roughly 25%), a fair sample. Table II more accurately shows the distribution of *Salmonella* in Canada than do our figures (Table I). Of the 2,500 cases of typhoid and paratyphoid reported in Canada, 1,552 (62%) were from Quebec and 400 (16%) from British Columbia. More cultures were actually received from British Columbia than from Quebec.

In Table III are shown the types of *Salmonella* isolated from animal sources, including animal food products, which were submitted to the Centre during the period of investigation.

### *Types Found*

Some 240 serological types of *Salmonella* have been described, of which Ranta and Dolman<sup>1</sup> reported that 37 had been identified in Canada to March 31, 1947. Crossley et al.<sup>3</sup> in 1948 reported the finding of *S. reading* (in chickens) and, in 1949, Crossley and co-workers<sup>4</sup> reported the isolation of *S. typhi suis* from the lung of a pig, the first report of the occurrence of this type in North and South America. The Ontario Department of Health reported the isolation in their laboratories of *S. rubislaw* and *S. singapore* in 1948<sup>5</sup>, *S. javiana* and *S. canoga* from human sources in 1949<sup>6</sup>, *S. eastbourne* from a human case in 1950 and *S. dublin* from an animal source in 1951<sup>7</sup>. Ten additional types have been identified by us—viz., *S. wien*, *S. sandiego*, *S. saint paul*, *S. californica*, *S. heidelberg*, *S. kentucky*, *S. panama*, *S. meleagridis*, *S. vancouver* and *S. adelaide*—thus bringing the total number of types identified and reported to date in Canada to 55. One of these types, *S. vancouver*, was a new type isolated in British Columbia in 1950 from a woman with severe gastro-enteritis<sup>8</sup>. Another, reported as a new type—*S. montreal*—by Laidley et al.<sup>9</sup> was later considered by the Nomenclature Committee of the International Association of Microbiologists to be identical with *S. wien*, which was first reported at much the same time in Europe by Roschka<sup>10</sup> and was considered to have priority.

TABLE II

"TYPHOID AND PARATYPHOID" CASES REPORTED IN CANADA BY THE PROVINCIAL DEPARTMENTS OF HEALTH (NOV. 5, 1948, TO OCT. 18, 1952)  
(From the Dominion Bureau of Statistics Reports)

Year	Can.	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
From Nov. 5, 1948	60	0	0	1	0	45	3	0	6	0	5
1949	769	6	2	8	30	502	76	13	10	13	109
1950	710	12	0	6	25	414	53	10	22	15	153
1951	546	8	0	1	21	315	32	5	12	40	112
To Oct. 18, 1952	415	12	1	4	17	276	36	7	19	22	21
TOTAL	2500	38	3	20	93	1552	200	35	69	90	400
% OF TOTAL		1.5	0.1	0.8	3.7	62.1	8.0	1.4	2.8	3.6	16.0

Of the 40 types identified at this centre during this period of investigation, many were found only rarely. On the other hand, a few types occurred very commonly and were widely distributed. The five types—*S. typhi murium*, *S. paratyphi B*, *S. typhi*, *S. newport* and *S. oranienburg*—alone accounted for 82% of the cultures identified from human isolations, while *S. typhi murium* and *S. oranienburg* were the commonest types found (52%) among the 'animal' strains.

It must be mentioned here that the percentage incidence of the different types shown in Table I is not the 'true' incidence of these types, for in some outbreaks involving many cases only representative cultures were submitted. This is particularly true in respect to *S. typhi murium*, which was responsible for 7 known outbreaks involving some 200 cases, from which only 13 cultures were received and are listed. From 3 outbreaks of Salmonellosis proven to be due to *S. newport*, affecting more than 50 persons, a single culture from each outbreak was received, and from one outbreak (15 cases) due to *S. anatum* a single culture also was received. Our observations confirm the findings of Ranta and Dolman<sup>1</sup> on 317 cultures of *Salmonella* isolated in various parts of Canada. They stated that, exclusive of *S. typhi*, the five types—*S. typhi murium*, *S. newport*, *S. thompson*, *S. paratyphi B* and *S. oranienburg*—accounted for 85% of the total.

The relative incidence of *S. typhi* is probably much higher than that shown in Table I, viz. 13.8%. In Ontario, for example, where three types of *Salmonella* infections are reported, namely, typhoid fever, paratyphoid fever and "salmonellosis", for the four years 1947-1950, there were 219 cases of typhoid, 59 of paratyphoid and 124 of "salmonellosis"<sup>11</sup>. Thus typhoid fever accounted for more than half (54%) of the reported cases of *Salmonella* infections. *S. typhi* cultures were not specifically requested and most laboratories submitted only those cultures which they wished to have phage-typed.

Bigland and Wilton<sup>12</sup> reported that of 47 *Salmonella* cultures isolated from animals in Alberta, 38.3% were identified as *S. oranienburg*, 29.8% as *S. typhi murium*, and 10.7% as *S. thompson*.

TABLE III  
SALMONELLAE (ISOLATED FROM ANIMAL SOURCES) IDENTIFIED AT THE LABORATORY OF HYGIENE, OTTAWA  
NOVEMBER 6, 1948, TO OCTOBER 31, 1952

Group	Type	SOURCE															TOTAL	%
		B.C.		Alta.				Sask.		Ont.				Que.		P.E.I.		
		Food (Turkey)	G.P.	Poul-try	Swine	Dog	Mink	Animal Sp. ?	Rat	Poul-try	Poul-try	Swine	Mouse	Egg	Poul-try		G.P.	
B.	S. paratyphi B						3	2			1						6	1.8
	S. san diego			2													2	0.6
	S. heidelberg			4													4	1.2
	S. typhi-murium	1		83			1	16	1	1		4	2				109	33.3
	S. derby					2										2	4	1.2
	S. bredeney			6				3	1	1						2	13	4.0
C <sub>1</sub>	S. cholerae-suis			2	3			4				3					12	3.7
	S. thompson			12							5				1		18	5.5
	S. oranienburg			39				19			1			3			62	18.9

	1	1	1	4	4	19	2	3	2	6	1	4	10	3	5	7	2	2	15	26	7.9
S. bareilly																					
S. tennessee						2													1	3	0.9
C <sub>2</sub> S. manhattan																			3	3	0.9
S. newport	1					5						1								7	2.1
S. kentucky						5						1							5	11	3.3
D. S. enteritidis						1										1		2	2	6	1.8
S. javiana										1										1	0.3
S. pullorum-gallinarum						15						9	2							26	7.9
E <sub>1</sub> S. anatum						2														2	0.6
E <sub>2</sub> S. newington						4				1		1					1			7	2.1
E <sub>3</sub> S. senftenberg											1									1	0.3
F. S. rubislaw																				1	0.3
G. S. worthington						2														2	0.6
H. S. minnesota						1														1	0.3
TOTALS	1	1	204	3	2	6	61	1	4	10	3	5	7	2	2	15	327				



*S. typhi murium*, one of the most commonly found types in Canada, is considered to be primarily an 'animal' strain. It is one of the most frequently found types in animals, accounting for one-third of all *Salmonella* cultures isolated from animals which we received. In man, this type ordinarily produces a 'gastro-enteritis' rather than a 'typhoid-like fever' type of illness. It is very often involved in food-poisoning outbreaks. During the period covered by this report, it was known to be the causal agent of such an outbreak at Vermilion, Alberta, in 1950, involving 103 students at a college with a total enrolment of 200; of another in Victoria, B.C. in the same year, in which 150 of 300 persons attending a banquet became ill, and of two other outbreaks of food poisoning in British Columbia in 1951.

One of the characteristics of Salmonellosis is the fact that the very young, the old and the sick or debilitated are more susceptible to infection. In the present series of cultures studied, 50% of the *S. typhi murium* strains from cases on which we had the case history, were from children under the age of 5 years. Two deaths were reported due to this type, both in persons over 70 years of age.

*S. paratyphi B*, on the other hand, the other most commonly found type in human Salmonellosis, is, like *S. typhi*, primarily a 'human' strain and is not commonly found in animals. Table III, however, shows that it is not a strict human parasite. Six cultures of this type, isolated from animal sources (including mink and poultry), were identified in the series of cultures studied. Like *S. typhi murium*, *S. paratyphi B* is widely distributed throughout Canada, from Newfoundland to British Columbia. One of the curious things observed in the present series was that roughly twice as many of the *S. paratyphi B* cultures came from females as from males.

The other common types—*S. oranienburg* and *S. newport*—are, like *S. typhi murium*, frequently found in both animals and man in Canada. They too, like *S. typhi murium*, ordinarily produce 'gastro-enteritis' in man and appear more virulent for children and old people. More than half (58%) of the human cases (26) of *S. oranienburg* infection in the present series, on whom the case history was submitted, were children under 3 years of age. One infant developed meningeal complications and died, and 2 others had convulsions with very high temperatures, while all had severe diarrhoea. Both blood and stool cultures were positive in a number of these cases. *S. oranienburg*, the second most commonly found type, was found in 19% of the 'animal' isolations submitted; poultry was the principal source of these strains. *S. newport* caused a number of 'food poisoning' cases. It was responsible for an outbreak in 1950 in New Westminster, B.C., involving 22 persons—75% of those attending a picnic—and for 2 other food poisoning outbreaks in British Columbia in 1951, involving more than 30 people, one of whom died. Two other deaths were attributed to this type, one a man, 73 years old, who developed severe diarrhoea after eating a suspected meal and the other an old woman of 87 with heart disease who suffered vomiting and diarrhoea for three days before dying.

Most of the other types reported in this series occurred relatively infrequently.

*Types not Previously Reported in Canada*

Reference has already been made to *S. vancouver* and *S. wien*.

*S. californica* (IV, XII; g, m, t -) was isolated from the faeces of a woman in a nurses' home in Essondale, B.C., in July 1952.

*S. sandiego* (IV, V, XII; e, h - e, n, z<sub>15</sub>) was isolated in 1950 from the stool of a man with gastro-enteritis in Waterloo, Que. This man had recently returned from a visit to the West Indies and it is possible that he contracted this infection outside of Canada. Since then it has appeared in two other cases in British Columbia and two in Quebec and also in poultry in Alberta.

*S. heidelberg* (IV, V, XII; r - 1, 2) was first isolated in May, 1952, from 2 flocks of chickens in Alberta. In one it caused a loss of 30 out of 300 birds and in the other a loss of 60 birds. In the following month it was isolated from another poultry flock. The first human case occurred in July in a 10-month-old boy with diarrhoea in Cardston, Alberta. The family kept chickens but there was no record of any illness amongst these or amongst any of the other members of the family, including 4 siblings. During the same month, *S. heidelberg* was recovered from 2 other human cases, one, a 5-year-old girl with diarrhoea and abdominal cramps (Didsbury, Alberta), the other, a man acutely ill with diarrhoea, working in a construction camp near Calgary, Alberta; and from another outbreak in chickens causing the loss of 100 out of 300 birds. Two cultures have since been received from British Columbia—one, from a butcher in Vancouver with acute gastro-enteritis (September 1952) and the other from a patient on an Indian Reserve at Powell River (October 1952).

*S. saint paul* (I, IV, V, XII; e, h - 1, 2) was isolated in British Columbia in 1951 but no information was available other than that it had come from man. This has been the only isolation of this type reported to date in Canada.

*S. kentucky* ((VIII), XX; i - z<sub>6</sub>) was first isolated in 1949 from a man in British Columbia under chloramphenicol treatment for 'typhoid fever'. *S. typhi* had disappeared from the stools under the antibiotic therapy when *S. kentucky* was first isolated. This individual presents an interesting case, as a few months later still another Salmonella type, *S. newington*, was recovered from his stool. In the present series of cultures reported, this type has been recovered from 5 human cases, 2 in British Columbia, 1 in Alberta and 2 in Quebec, and 11 times from animal sources—6 in Alberta and 5 in Prince Edward Island—so although an uncommon type at present, it is widely distributed.

*S. panama* (1, IX, XII; 1, v - 1, 5, 11). A single culture of this type was received. This was isolated from a blood culture of a nurse (aged 27) in Sorel, Quebec, in July 1952. The Ontario Department of Health reported the isolation of *S. panama* from a blood culture (human case) in the same month.

*S. melagroidis* (III, X; e, h - 1, w) first appeared in 1950 in two patients in a Montreal hospital, both suffering from what was clinically diagnosed as chronic colitis. There had been no contact between these two before hospitalization, which suggests a hospital cross-infection. The third culture received was isolated from a 2½-month-old baby boy with loose stools.

*S. adelaide* (XXXV; f, g -) was isolated in 1950 from the stool of an infant in British Columbia with vomiting and diarrhoea. A single culture of this type has been received to date.

#### DISCUSSION

This report is an attempt to show the distribution of the different types of *Salmonella* throughout the country. All cases of *Salmonellosis* occurring in man in Canada are not cultured—or even reported, for that matter—and our national centre did not receive all *Salmonella* cultures that were isolated from 'cultured' cases. We did receive a reasonably good proportion of these, and it is probable that our report gives a fairly accurate picture of the relative incidence of the different types. This cannot be said for animal *Salmonellosis* in the country. *Salmonella* infections are common in animals, and most agree that animals constitute the principal source of *Salmonella* infection (exclusive of *S. typhi*, *S. paratyphi* A and *S. paratyphi* B) in man. The few cultures from animals which we received do not in any way indicate the incidence of this type of infection in animals in Canada and probably do not even present a true picture of the relative distribution of the different types. *Salmonellosis* will remain a problem in this country unless the epidemiology of these infections is more closely investigated. Being as much an animal as a human disease, it must be more thoroughly investigated by our veterinary bacteriologists and public health officers. 'Typing' is an essential tool in the epidemiological investigation of these diseases.

While the ability to type any of the more than 200 *Salmonella* types, presently recognized, requires a large battery of O and H antisera, it is possible for the public health laboratory in this country, with 5 O, a Vi and 8 H sera, to identify the seven commonest types found (*S. typhi murium*, *S. paratyphi* B, *S. typhi*, *S. newport*, *S. oranienburg*, *S. thompson* and *S. bareilly*)—which together account for the great majority, probably over 90%, of the cultures which it is likely to encounter. The Laboratory of Hygiene now prepares for distribution to the provincial laboratories polyvalent *Salmonella* antisera which will detect the O antigens of any of the *Salmonella* types and the O and H sera for the complete identification of the seven types most commonly found in Canada. In addition, the National *Salmonella* Reference and Typing Centre is ready and willing to assist in any epidemiological investigation of *Salmonellosis* by typing of cultures submitted.

#### SUMMARY

1. From November 1948 to October 31, 1952, 1,102 *Salmonella* cultures isolated from humans and 327 from animals were identified serologically at the National *Salmonella* Reference and Typing Centre, Laboratory of Hygiene, Ottawa.
2. Forty types of *Salmonella* were found, of which the most common from man were *S. typhi murium* (30%), *S. paratyphi* B (24%), *S. typhi* (14%), *S. newport* (10%) and *S. oranienburg* (5%), and from animals—*S. typhi murium* (33%), and *S. oranienburg* (19%).

3. *S. sandiego*, *S. saint paul*, *S. californica*, *S. heidelberg*, *S. kentucky*, *S. panama*, *S. meleagridis* and *S. adelaide* are reported for the first time in Canada.

#### ACKNOWLEDGMENTS

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#### ADDENDUM

Since this report was compiled, we have been informed by the Ontario Department of Health Laboratories of their isolation in January 1952 of *S. poona* from a human case. This should be added to the list of types reported in Canada, making a total of 56 different serological types to date.

# Canadian Journal of Public Health

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## THE INTEGRATION OF MENTAL HEALTH IN THE PUBLIC HEALTH PROGRAM

MEDICAL horizons have progressively broadened during recent years. Impetus has been given to this evolution by the startling findings of poor health amongst many of our young people and the general appreciation of the significance of chronic and psychiatric diseases. The boundaries of health are most concisely defined by the World Health Organization: "Health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity". Extension to the new horizons is apparent in the progressive expansion of social medicine, preventive psychiatry and rehabilitation, all of which are aimed at the development of a healthier population. These three aspects of the expanding health services should be the means of translating into action such broadened concepts of health programs. These programs are not dependent on the application of drugs or technical skills, but rather, on the basis of sound medical principles, should aim to bring about changes in the community which will improve the total health of the population. They should bring to students and practitioners alike a clearer knowledge of the influence of the community in the development of good health and the treatment of disease.

For many years mental hygienists have been advocating a combined personal and sociological approach to illness in the hope of bringing about a decrease in the morbidity of mental illness. Unfortunately there has been little evidence to suggest a real understanding of this broad approach to health problems by medical and allied professions or by the public at large. The general acceptance of a personal, individual and sociological approach to health is a *sine qua non* if social medicine, psychiatric services and rehabilitation are to achieve a true state of complete physical, mental and social well-being and not merely the treatment and prevention of disease. As public health programs have diminished communicable and deficiency diseases, and applied therapeutics have helped to extend the life span, it has become increasingly obvious that our greatest morbidity now occurs in the chronic and psychiatric diseases.

The failure to accept a personalized, sociological approach to health is due in large part to the modern tendency to compartmentalize our health programs. The result is that health workers are prone to consider mental health as separate from physical health; that social medicine is not the responsibility of the doctor; that rehabilitation begins only after medical treatment ends. We must teach a total philosophy of medical service. This philosophy must include not only the treatment of illness, not only the prevention of illness, but far more important, the development of people to the point where they may lead really useful, healthful and meaningful lives. The challenge to medical educators and health administrators today is to find a way of bringing together the skills and knowledge from all specialized fields of health and welfare so that the key persons in such an integrated program—e.g., the family doctor, the nurse, the health educator, etc.—will consider the promotion of better health an integral and continuous part of their own work and thus be properly oriented to play their roles in this positive health program.

*C. A. Roberts*

## **CANADIAN PUBLIC HEALTH ASSOCIATION**

**Forty-first Annual Meeting**

**Royal York Hotel, Toronto**

**October 1 and 2, 1953**

## **ONTARIO PUBLIC HEALTH ASSOCIATION**

**Fourth Annual Meeting**



## NEWS

### Alberta

DEATHS FROM TUBERCULOSIS among the Indians of Alberta are now about one-third as numerous as they were five years ago. The total in 1952 was 34, compared with about 90 in 1947. An encouraging feature of the 1952 record is that no tuberculosis deaths occurred in three bands—the Black-foot, Peigan, and Sarcee. These bands have co-operated fully in the chest x-ray and treatment programs undertaken by the division of Indian Health Services, Department of National Health and Welfare.

Twenty-four deaths from tuberculosis were recorded from patients in northern Alberta, where less than half of Alberta's Indian population lives.

Dr. W. L. Falconer, medical superintendent of the Charles Camsell Indian Hospital, Edmonton, has found that the bands of Indians with the higher death rates are among the groups which resist having chest x-rays and taking treatment. In some instances, more than one death occurred in a family in which an Indian with active tuberculosis refused to enter hospital.

Twelve of the deaths were caused by tuberculous meningitis in children. With treatment, about half the cases of tuberculous meningitis can be cured but more than half the fatal meningitis cases did not go to hospital.

During the past year, 381 Alberta Indians received treatment for tuberculosis at the Charles Camsell Indian Hospital, the Federal Health Department's main treatment centre for Indians living in Alberta and the Mackenzie district.

### Saskatchewan

OFFICERS AND CONSULTANTS of the Department of Public Health met with field personnel in a three-day staff conference conducted immediately following Easter. This was the third such annual meeting and it brought to headquarters medical health officers, public health nurses, sanitary officers, health educators, nutritionists, and psychologists for discussion of pro-

gram and methods. The conference was divided into one and a half days devoted to general sessions and one and a half days in professional groups, with two evenings of entertainment.

Outstanding in the general sessions were demonstrations involving role-playing to demonstrate various techniques for nurses and sanitary personnel in establishing good rapport with the public. In discussion sessions the need of more training and activity in health education and in promoting favorable public relations received emphasis. Talks to the field staff were confined to a welcome from the Hon. T. J. Bentley, minister of public health; a review of the year's work and the tasks ahead by Dr. F. B. Roth, deputy minister; and clarification of administrative detail by George Townshend, director of administrative services.

THE DEPARTMENT has offered three types of bursaries through its Division of Hospital Administration and Standards. The first is to assist toward post-graduate training in nursing education, clinical supervision, or nursing administration. The second type of bursary is to provide post-graduate training in physiotherapy, and the third is to give training for medical-record librarians and medical-social workers. The bursaries will apply to the 1953-54 academic session and all applications are to be received in the Department not later than May 15.

### Manitoba

DR. MORLEY R. ELLIOTT, Deputy Minister of the Department of Health and Public Welfare, will sail April 25 for the sixth annual conference of the World Health Assembly, in Geneva, Switzerland. Dr. Elliott will represent the Dominion Council of Health at the Assembly, which will take place May 3 to 26.

MR. WILLIAM RENNIE, Research Division, Department of National Health and Welfare, was a recent visitor to the Provincial Department of Health and Public Welfare, in connection with the recent provincial health survey.



Mr. C. H. McEwen, formerly sanitary inspector of the Virden Local Health Unit No. 7, has been appointed to the position of Town Superintendent of Virden.

SELKIRK GENERAL HOSPITAL DISTRICT No. 31 has completed plans for the construction of a sixty-bed hospital, to be situated in the town of Selkirk. Plans include the incorporation of 30 nurses' beds, 18 bassinets in cubicles, two labor beds, and accommodation for the headquarters of the Selkirk Health Unit and the Selkirk Laboratory and X-ray Unit. The Hospital will serve 17,500 people in the town of Selkirk and the two rural municipalities of St. Andrews and St. Clements.

### Ontario

AMONG THE MOST IMPORTANT pieces of legislation introduced by the Minister of Health, the Hon. Mackinnon Phillips, M.D., C.M., and enacted at the recent sitting of the Ontario Legislature, were bills concerning the Pharmacy Act and the Cemeteries Act.

The Pharmacy Act, enacted in 1871 and revised in 1884 and 1911, was again revised, practically in its entirety. The new Act introduces the following principles. Definitions of the words "drug" and "poison" are more restrictive. The Council of the College is authorized to cancel a certificate of registration of a pharmaceutical chemist for negligence, incompetence, or improper conduct in a professional respect. No Corporation which starts business after the Act comes into force can operate a pharmacy unless a majority of each class of shares is owned by and registered in the name of pharmaceutical chemists. The list of drugs that must be sold on prescription is extended. The list of drugs that may be sold by persons other than pharmaceutical chemists is also extended.

The legislation concerning the Cemeteries Act consists of amendments that brought regulations concerning burial grounds up to date. However, this Act may be further revised at the next session of the Legislature, by which time a select committee, appointed at the recent session, will have reported its findings. This committee was set up by the Legislature for the purpose of inquiring into and reviewing the Cemeteries Act and the regulations made under it. The inquiry, now under way,

will be concerned more particularly with the creation, investment and supervision of funds for perpetual care of cemeteries, cemetery plots, monuments and other cemetery facilities. Also under investigation will be methods of selling cemetery plots, tombs and other cemetery services, and the methods of caring for cemeteries.

During the recent session, general amendments were made to the Medical Act, the Embalmers and Funeral Directors Act, the Private Sanatoria Act, and the Public Health Act. One important amendment to the Public Health Act gives authority to townships to increase the membership of their boards of health.

THE HON. MACKINNON PHILLIPS, Minister of Health, has announced the appointment of Miss Marian Wight, B.Sc., as nutritionist for the Ontario Department of Health. She succeeds Mrs. Marion Voegelé, who resigned last December. Miss Wight obtained the B.Sc. degree in Home Economics from Macdonald College, McGill University, and holds a Diploma in Community Nutrition from the Canadian Dietetic Association. She was formerly with the Women's Institute Branch and Home Economics Service, Nutrition Section, Ontario Department of Agriculture. Miss Wight will continue to develop the Department's nutrition program and will act in a consultant and advisory capacity to public health nurses.

### Quebec

DR. ALPHONSE LAPIERRE, director of the County Health Unit of St. John, died suddenly on March 20, while vacationing in Miami. Dr. Lapierre was one of the early group of medical officers of health who were responsible for the development of public health in this province. In addition to his professional attainments, he was active in many professional and civic organizations and contributed to their work the same energy and devotion that had marked his public-health career.

### New Brunswick

A PUBLIC FORUM on the subject of mental health, under the auspices of the Fredericton Branch of the Canadian Mental Health Association, was held on Monday, March 30, with Dr. H. MacKinnon as chairman. The discussion was opened by Dr. C. Alexander, who presented the hypothetical history of a case such as is frequently seen

in general medical practice. Dr. Ora Smith, of the Department of Health and Social Services, and psychiatrist in charge of the Fredericton Mental Health Clinic, discussed the nature and purpose of a psychiatric case history, stressing the strict confidence in which such information is held. An introduction to the rationale underlying psychological test procedures was given by Mr. Ralph Stymest, clinical psychologist, who also differentiated between play therapy and other forms of psychotherapy provided at the clinic. Mr. J. W. Donnachie, psychiatric social worker, discussed the purpose of his interviews with the patients' relatives and commented on the value of home visits in the management of clinical problems referred for psychiatric help. This presentation was followed by general discussion, the main points of which were summarized by the chairman.

MISS FLORENCE SWAN, senior nutritionist, and Miss Thelma Sewell, junior nutritionist, in the Maternal and Child Health Division of the Department, recently attended the Annual Folk School held at Shediac. The 12-day Folk School provided an opportunity for the integration of nutrition and other phases of public health with the regular topics under discussion.

THE MENTAL HEALTH DIVISION of the Department of Health and Social Services participated for the first time in the program scheduled for the annual meeting of the New Brunswick Teachers' Association, which was held in Fredericton on April 9 and 10. In an introductory address, the Chief Medical Officer, Dr. J. A. Melanson, traced the background of developments leading to the formation of the New Brunswick Mental Health Division and outlined the nature and aims of mental health services. He commented favourably on the services provided by the mental health clinics in the Province. Dr. E. G. Poser, senior psychologist, Mental Health Division, dealt with some major mental health problems confronting the school population of New Brunswick. A hypothetical case of a maladjusted child referred by a school teacher was discussed by a panel of professional workers consisting of a school teacher, a psychiatrist, a social worker, and a clinical psychologist.

A SEMINAR on Projective Techniques and Personality Study, sponsored by the

Mental Health Division and the University of New Brunswick, will, it is expected, be held in Fredericton June 1 to 12 inclusive. The seminar will be under the direction of Dr. E. G. Poser, senior psychologist of the New Brunswick Mental Health Division. The emphasis will be on Rorschach technique. Introductory and advanced classes will be held. The seminar is especially designed to meet the needs of clinical psychologists in the Government Service, but applications from suitably qualified personnel in psychiatry and social science are also invited.

#### Ottawa

DOCTOR MARY A. ROSS has resigned as Assistant Director of the Health and Welfare Division of the Dominion Bureau of Statistics. She joined the staff of the Bureau in September 1944, as Field Research Assistant in what was then the Vital Statistics Division, and served as adviser to some of the Provincial Health Departments in the reorganization of their statistical branches. Later she was instrumental in the creation of the new Public Health Section of the Bureau, of which she was Chief until her appointment, in December 1952, as Assistant Director of the Health and Welfare Division. During these years Dr. Ross established basic statistical services, carrying out studies of special problems connected with health and health services. She had a leading part in the design and the planning of the Canadian Sickness Survey, 1950-51. Before joining the staff of the Bureau, Dr. Ross was Associate Professor of Biometrics in the School of Hygiene, University of Toronto.

#### First International Convention of X-Ray Technicians

THE FIRST INTERNATIONAL CONVENTION of X-Ray Technicians will be held in Toronto, at the Royal York Hotel, from June 28 to July 2, under the sponsorship of the Canadian Society of Radiological Technicians and the American Society of X-Ray Technicians. Many prominent speakers from the United States and Canada will take part in the sessions. Information about the convention can be obtained from Mrs. Mary F. Cameron, 250 Main Street East, Hamilton, general chairman; or Mr. L. J. Cartwright, Hospital for Sick Children, Toronto, publicity chairman.

